

Name: \_\_\_\_\_

Period: \_\_\_\_\_

Date: \_\_\_\_\_

### pH Experiment

1.) Ten household solutions will be tested to see whether they are acids, bases, or neutral. First, predict (hypothesize) what pH you think these ten items will be. Next, determine whether the ten common household items are acidic, basic, or neutral by using blue and red litmus paper. Create a table with your results. Include the name of the household item, your prediction, blue litmus paper results, and red litmus paper results. Also, include a column for the pH probe results. Make sure you format your table correctly.

2.) The ten household substances will now be tested quantitatively for pH. Using a pH probe, take three readings of each substance and average the values together. Record this as the pH and repeat for all ten household solutions. Add this data to the table you created in #1. For instructions on how to use the pH probes, watch your instructor demonstrate how to use them.

3.) Some substances can be used as a natural pH indicator. Red Cabbage juice is one such indicator. Using a hot plate, stuff some red cabbage in a 600 mL beaker – pack it in so there is about 200 mL in the beaker. Then fill the beaker to the 400 mL mark with water. Bring the beaker to a rolling boil, stirring occasionally with a stirring rod. If you need to handle the beaker while it is hot be sure to wear oven mits! Allow the red cabbage to boil until the water turns dark purple and then turn the hot plate off and let it slowly cool for 5 minutes. Using a funnel, pour the red cabbage juice into a dropper bottle. Using tape and a permanent marker, label the dropper bottle with your lab group's initials and period.

Finally, place two drops of each of the ten household substances into the microtitre plate. Add two-three drops of the red cabbage juice. Record the color observed in a second table that also contains the pH that was determined using the pH probe. Make sure you format your table correctly.

Extra: Obtain a ½ cup of Diet Coke. Test the pH. Add Alka Seltzer and study the pH change over time.

#### Experimental Analysis

#1 Create a table that includes household solution, prediction of acid/base/neutral, blue litmus paper results, red litmus paper results, and pH from probe. This table should be done in EXCEL and printed out (or if you wish, wait until you are done with #2 and then print the table and the graph out together).

#2 Create a pH (Y Axis) versus Household substance graph (X Axis).

#3 Create a second table that denotes the color of the red cabbage juice indicator as well as the pH recorded from the probe for each of the ten substances.

#4 Write an analysis of your experiment. Your analysis should contain references to the two tables and to the graph. You should use technical writing (3<sup>rd</sup> person) and refer to actual data in your analysis. Elaborate. Explain.

Name: \_\_\_\_\_

Period: \_\_\_\_\_

Date: \_\_\_\_\_

\*\*\*Make sure to begin each paragraph of your analysis with a topic sentence that is supported by 4-5 other sentences that contain references to the data. Each paragraph should have a concluding sentence.\*\*\*

Your Analysis Should Include:

Paragraph 1. The first paragraph should contain an introductory sentence about the experiment followed by a short summary of the methods for the experiment.

Paragraph 2. The second paragraph should contain a summary of your findings from using the pH probe and the litmus paper (Table 1 and Graph 1). Consider the following questions: 1.) Which of these methods was most accurate? Why? Why not? 2.) Were your hypotheses proven correct or incorrect? 3.) Were any of your results surprising? Why or why not? 4.) Compare and contrast the pH values of the ten substances. Which ones are similar? Which are dissimilar? How much more acidic is the most acidic substance than the most basic, etc. Elaborate and explain. Add other observations and data. Reference actual pH values and the table/graph. Analyze!

Paragraph 3. The third paragraph should contain an analysis of your experiment with the cabbage juice (Table 2). Consider the following questions: 1.) What was the range of colors observed? Could this indicator be used reliably to test pH? What colors correspond to what pH values obtained from the probe? Elaborate and explain. Add other observations and data. Reference actual pH values and colors in the table. Analyze!

Paragraph 4. Paragraph four should be a summary paragraph of all of the results from the experiment. This paragraph should also contain a suggestion for a future, innovative experiment that is possible to do.